

WHAT IS CLAIMED IS:

1. A flat float glass that can be prestressed or transformed into a glass ceramic with high quartz mixed crystals or keatite mixed crystals, that has a concentration of less than 300 ppb Pt, less than 30 ppb Rh, less than 1.5 wt.% ZnO and less than 1 wt.% SnO₂ to prevent undesirable surface defects during floating, and that is refined during melting without the use of the conventional fining agents arsenic oxide and/or antimony oxide.

2. The flat float glass of Claim 1 comprising a composition in weight percent on an oxide basis of:

| | |
|---|---------|
| Li_2O | 3.2-5.0 |
| Na_2O | 0-1.5 |
| K_2O | 0-1.5 |
| $\sum \text{Na}_2\text{O}+\text{K}_2\text{O}$ | 0.2-2.0 |
| MgO | 0.1-2.2 |
| CaO | 0-1.5 |
| SrO | 0-1.5 |
| BaO | 0-2.5 |
| ZnO | 0-<1.5 |
| Al_2O_3 | 19-25 |
| SiO_2 | 55-69 |
| TiO_2 | 1.0-5.0 |
| ZrO_2 | 1.0-2.5 |
| SnO_2 | 0-<1.0 |
| $\sum \text{TiO}_2+\text{ZrO}_2+\text{SnO}_2$ | 2.5-5.0 |
| P_2O_5 | 0-3.0 |

optionally with the addition of coloring components such as V, Cr, Mn, Fe, Co, Cu, Ni, Se and/or Cl compounds.

3. Flat glass/as claimed in Claim 2, characterized by a composition (in wt.% on an oxide basis) of:

| | |
|--------------------------------------|---------|
| Li ₂ O | 3.5-4.5 |
| Na ₂ O | 0.2-1.0 |
| K ₂ O | 0-0.8 |
| Σ Na ₂ O+K ₂ O | 0.4-1.5 |
| MgO | 0.3-2.0 |
| CaO | 0-1.0 |
| SrO | 0-1.0 |
| BaO | 0-2.5 |
| ZnO | 0-1.0 |
| Al ₂ O ₃ | 19-24 |

| | |
|---|---------|
| SiO ₂ | 60-68 |
| TiO ₂ | 1.0-2.0 |
| ZrO ₂ | 1.2-2.2 |
| SnO ₂ | 0-0.6 |
| Σ TiO ₂ +ZrO ₂ +SnO ₂ | 3.0-4.5 |
| P ₂ O ₅ | 0-2.0 |

and optionally with the addition of coloring components such as compounds of V, Cr, Mn, Fe, Co, Cu, Ni, Se and/or Cl.

4. The flat glass as claimed in one of the Claims 1 to 3, characterized by the fact that the sum $\text{Li}_2\text{O} + \text{Na}_2\text{O} > 3.5 \text{ wt.}\%$ to produce chemically prestressed float glass.

5. Flat glass as claimed in one of the Claims 1 to 4, characterized by the fact that to prevent the formation of an undesirable crystal band near the surface during floating, the following expression (in wt.%) is valid: $3.2 \times \text{ZnO} + \text{TiO}_2 \leq 4.3$.

6. Flat glass as claimed in one of the Claims 1 to 5, characterized by concentrations of less than 200 ppm Fe_2O_3 and less than 2.5 wt.% TiO_2 to counteract undesired coloration in the vitrified state and to achieve a light transmittances at a thickness of 4 mm of $> 89\%$ and preferably $> 90\%$.

7. Flat glass as claimed in one of the Claims 1 to 6, characterized by the fact that the glass is technically, or industrially, free of ZnO and BaO.

8. Flat glass as claimed in one of the Claims 1 to 7, characterized by a coefficient of thermal expansion $\alpha_{20/300}$ between 3.5 and $5.0 \times 10^{-6}/\text{K}$, a transformation temperature T_g between 600 and 750°C and a processing temperature V_A below 1350°C .

9. Flat glass as claimed in one of the Claims 1 to 8, characterized by the fact that the glass ceramic manufactured by transformation has a transparent, translucent or opaque appearance, and has an additional color when coloring components are added.

10. Flat glass as claimed in one of the Claims 1 to 9, characterized by a coefficient of thermal expansion $\alpha_{20/700}$ of less

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than $1.5 \times 10^{-6}/K$ after transformation into the glass ceramic with keatite mixed crystals as the predominant crystal phase.

11. Flat glass as claimed in one of the Claims 1 to 10, characterized by a coefficient of thermal expansion $\alpha_{20/700}$ of $(0 \pm 0.5) \times 10^{-6}/K$, preferably $(0 \pm 15) \times 10^{-6}/K$, after transformation into the glass ceramic with high quartz mixed crystals as the predominant crystal phase of

12. Flat glass as claimed in Claim 11, characterized by the fact that the transparent glass ceramic, to achieve a light transmittance at 4 mm thickness of $> 80\%$, contains less than 2 wt.% TiO_2 , less than 0.5 wt.% SnO_2 and less than 200 ppm Fe_2O_3 .

13. Flat glass as claimed in Claim 11, characterized by the fact that the glass ceramic is colored with V, Cr, Mn, Fe, Co and/or Ni compounds with a light transmittance of $< 5\%$ at a thickness of 4 mm.

14. Flat glass as claimed in one of the Claims 1 to 13, characterized by the fact that to achieve a low number of bubbles, or seeds, at least one alternative chemical fining agent such as SnO_2 , CeO_2 , sulfate compounds, chloride compounds for example, preferably 0.2 - 0.6 wt.% SnO_2 is added to the glass melt.

15. Flat glass as claimed in one of the Claims 1 to 14, characterized by the fact that to achieve a low number of bubbles, the glass melt is physically fined, e.g. by underpressure or by means of high temperature $> 1750^\circ C$.

16. A flat float glass having surface defects which are minimized;

said glass being configured at least as one of:

- (a) to be prestressable;
- (b) to be capable of being transformed into a glass ceramic having surficial high quartz mixed crystals or keatite mixed crystals;

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oxide (Fe_2O_3), compounds of cobalt (Co), such as cobalt oxide (CoO), compounds of copper (Cu), such as copper monoxide (CuO), compounds of nickel (Ni), such as nickel oxide (NiO), and compounds of selenium (Se), and/or compounds of chlorine (Cl).

20. The flat float glass of Claim 1 comprising a composition in weight percent on an oxide basis of:

| | |
|---|-------------|
| Li_2O | 3.2-5.0 |
| Na_2O | 0-1.5 |
| K_2O | 0-1.5 |
| $\sum \text{Na}_2\text{O}+\text{K}_2\text{O}$ | 0.2-2.0 |
| MgO | 0.1-2.2 |
| CaO | 0-1.5 |
| SrO | 0-1.5 |
| BaO | 0-2.5 |
| ZnO | 0-<1.5 |
| Al_2O_3 | 19-25 |
| SiO_2 | 55-69 |
| TiO_2 | 1.0-5.0 |
| ZrO_2 | 1.0-2.5 |
| SnO_2 | 0-<1.0 |
| $\sum \text{TiO}_2+\text{ZrO}_2+\text{SnO}_2$ | 2.5-5.0 and |
| P_2O_5 | 0-3.0. |

21. The flat float glass according to Claim 20 which comprises coloring components such as compounds of V, Cr, Mn, Fe, Co, Cu, Ni, Se and/or Cl.

22. Flat glass as claimed in Claim 2, characterized by a composition (in wt.% on an oxide basis) of:

| | |
|---|-------------|
| Li_2O | 3.5-4.5 |
| Na_2O | 0.2-1.0 |
| K_2O | 0-0.8 |
| $\sum \text{Na}_2\text{O}+\text{K}_2\text{O}$ | 0.4-1.5 |
| MgO | 0.3-2.0 |
| CaO | 0-1.0 |
| SrO | 0-1.0 |
| BaO | 0-2.5 |
| ZnO | 0-1.0 |
| Al_2O_3 | 19-24 |
| SiO_2 | 60-68 |
| TiO_2 | 1.0-2.0 |
| ZrO_2 | 1.2-2.2 |
| SnO_2 | 0-0.6 |
| $\sum \text{TiO}_2+\text{ZrO}_2+\text{SnO}_2$ | 3.0-4.5 and |

~~P₂O₅~~

~~0-2.0.~~

~~23. The flat float glass according to Claim 22 and comprising coloring components such as compounds of V, Cr, Mn, Fe, Co, Cu, Ni, Se and/or Cl.~~

~~24. The method according to Claim 18 comprising one of: a transformation temperature T_g between 600 and 750°C, and a processing temperature V_A below 1350°C for a glass characterized by a coefficient of thermal expansion $\alpha_{20/300}$ between 3.5 and 5.0 x 10⁻⁶/K.~~

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